were Sir Charles Dilke, Prof. Tyndall, and the Archbishop of York. It is to be hoped that the public, and especially those on whose skill and honesty our sanitary arrangements are dependent, will take ample advantage of the opportunities offered by the new museum.

THE seventh Congress of Russian Naturalists and Physicians will be held this year at Odessa, from August 30 to Sept. 9.

THE district of Pergamos in Asia Minor is now so infested with sparrows that application has been made to the Turkish Government for aid against them. It will be remembered that this district is subject to occasional invasions of rodents.

THE Marine Excursion Committee of the Birmingham Natural History and Microscopical Society announce that, in response to a wish expressed by many members, they have arranged a second excursion to Oban and the West Highlands of Scotland, similar to that which proved so successful in the year 1881. The party will leave on Friday, June 29 next, to reach Oban about 5 p.m. on Saturday. The screw steam yacht *Aerolite*, of about sixty tons, has been hired of Messrs. Ross and Marshall of Greenock for a week, commencing Monday, July 2; facilities will thus be afforded for dredging excursions not only in the district previously worked, but also in distant localities. Arrangements are being made for excursions to several places of interest in the neighbourhood of Oban.

THE sixth annual meeting and *conversazione* of the Midland Union of Natural History Societies will be held at Tamworth on June 12 next. Excursions have been arranged for that day and the 13th. The Darwin Gold Medal for 1882 will be presented to Prof. A. M. Marshall and W. P. Marshall, for their paper on the Pennatulida.

THE additions to the Zoological Society's Gardens during the past week include a Malbrouck Monkey (*Cercopithecus cynosurus*) from West Africa, presented by Mr. C. D. Gordon; two Grisons (*Galictis vittata*) from South America, presented by Mr. Percy Kenyon Slaney; two Sloth Bears (*Melursus labiatus*) from India, presented by Mr. F. A. Curteis; a Surucucu or Bushmaster (*Lachesis mutus*) from Pernambuco, presented by Mr. J. Y. Barkley; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Mr. Henry W. Weguelin; a Chimpanzee (*Anthropopithecus troglodytes* δ) from West Africa, two Welsh Sheep (*Ovis aries*) from Wales, a Goffin's Cockatoo (*Cacatua goffini*) from Queensland, five Margined Tortoises (*Testudo marginatus*), thirteen European Pond Tortoises (*Emys europæa*), South European, deposited; a Common Seal (*Phoca vitulina*) from British Seas, a Grey-headed Porphyrio (*Porphyrio poliocephalus*), a Conical Worm Snake (*Gongylophis conicus*) from India, purchased; a Hybrid Tapir, ♀ (bred between *Tapirus roulini* δ and *Tapirus americanus* ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE MINOR PLANET, ANDROMACHE.—Among the small planets mentioned in the last volume of the *Berliner Astronomisches Jahrbuch* as having been observed at one opposition only, though several oppositions have taken place since their discovery, is No. 175, detected by the late Prof. Watson of Ann Arbor, U.S., on October 1, 1877, and named *Andromache*. The orbit has a considerable eccentricity, and the planet recedes to a greater distance from the sun at aphelion than is the case with any other member of this now numerous group so far calculated; indeed at this point of its orbit it is distant from the sun 4·723 (the earth's mean distance being taken as unity), and only 0·594 from the orbit of Jupiter. There should be no great difficulty in recovering this planet during the month of June or in July. According to the most accurate elements calculated by Prof. Watson it will be in perihelion about July 25, and in opposition a fortnight earlier, its computed intensity of light being equal to that of a star of fully the ninth magnitude. Its considerable south declination will give an advantage to a search at one of the observatories of southern Europe. To facilitate its reobservation we subjoin positions deduced from the orbit last published :—

At Greenwich Midnight

	R.A. h. m.	Decl.	Log. Distance from Earth.	Sun.
June 4 ...	19 40·3 ...	−27 23 ...	0·1547 ...	0·3635
12 ...	19 39·0 ...	27 44 ...	0·1368 ...	0·3622
20 ...	19 36·0 ...	28 7 ...	0·1222 ...	0·3610
28 ...	19 31·5 ...	28 29 ...	0·1117 ...	0·3600
July 6 ...	19 25·9 ...	28 48 ...	0·1059 ...	0·3594
14 ...	19 19·9 ...	−29 1 ...	0·1055 ...	0·3590

The planet will probably be situated at some distance in R.A. from these positions, which are only intended as an approximate indication of its places. The last reference to a search for it which we find in the circulars of the *Berliner Jahrbuch*, occurs in No. 118 (Correspondenz), 1881, March 3, where we read, "*Andromache* innerhalb −6m. 30s. bis −3m. 55s., und − 2m. 20s. bis +4m. 15s. vergeblich gesucht." A special rough chart of stars in the vicinity to the tenth magnitude inclusive would be readily formed with the stars in the Bonn and Washington Zones as reference points.

THE GREAT COMET OF 1882.—M. W. Fabritius of Kieff has calculated the following elliptical elements of this comet from two normal positions for September 9 and October 6, and an observation at Königsberg on March 3 in the present year :—

Perihelion passage, 1882, September 17·2753 M.T. at Berlin.

Longitude of perihelion	276° 28′ 40″·1	M. Eq. 1882·0
,, ascending node	345 58 4·1	
Inclination	38 0 44·7	
Log. (1 − *e*)	5·938209	
Log. semi-axis major	1·943548	
Log. perihelion distance	7·881757	

Motion—retrograde.

The corresponding period of revolution is a little less than 823 years, and as M. Fabritius attaches some weight to his result, he thinks the comet must have appeared about the middle of the eleventh century.

We shall doubtless have in due course a thorough discussion of all reliable observations; those made since September 30, when the disintegration of the nucleus commenced, will need special treatment.

THE OBLIQUITY OF THE ECLIPTIC.—In NATURE, vol. xxvii. p. 618, we quoted 23° 41′·1 as the value of the obliquity of the ecliptic at the assigned epoch of Ptolemy's catalogue. With reference to this statement Mr. W. J. Cockburn Muir, of Melrose, N.B., has made a discovery, on which he writes us as follows :—"In NATURE of April 26, at p. 618, I read that the 'obliquity of the Ecliptic' is 23° 41′·1, and I wondered much what had suddenly happened in the Kosmos. So I took means to ascertain from the Royal Observatory of Greenwich how the record stands, and I am comforted to find that, by the determinations in 1882, the earth's axis still remains at home—23° 27′ 16″·8." Our correspondent may be referred to any elementary treatise on astronomy.

GEOGRAPHICAL NOTES

MR. OSCAR DICKSON'S Greenland Expedition, under the command of Baron Nordenskjöld, sailed from Gothenburg in the *Sofia*, 180 tons, 65 horse-power, drawing 10 feet, and of 11 knots speed, navigated by Capt. Nilsson and a crew of 13 men. With Baron Nordenskjöld are Dr. Nathorst, geologist; Dr. Berlin, doctor and botanist; Dr. Forsstrand, zoologist; Dr. Hamberg, hydrographer; Herr Kolthoff, zoologist; Herr Kjellström, typographer and photographer; two Laplanders, two Norwegian icemasters, and one harpooner. There is on board a complete scientific equipment and 14 months' provisions for subsistence on the inland ice. Eight or nine picked men accompany Baron Nordenskjöld. Count Stromfeldt, botanist; Dr. Arpi, archæologist and philologist; and Herr Flink, mineralogist, will disembark on the coast of Iceland for the purposes of

study and collection. The *Sofia* called at Thurso for coal on Sunday and left on Tuesday.

In connection with Prof. Fries' suggestion of colonising Greenland by mountain Lapps, to which we referred last week, we learn that Baron Nordenskjöld takes with him to Greenland two Lapps from Jockmock, to give their opinion of the country. One of them is thirty, and the other thirty-three years of age.

We learn from the last annual report of the East Siberian branch of the Russian Geographical Society that this Society, which has contributed so largely to the increase of our knowledge of Siberia, is beginning to recover from the losses it sustained during the great fire at Irkutsk. Private subscriptions have been raised for the reconstitution of the library and museum to the amount of 2170*l.*, and both are in a fair way of development. The library already has about 4000 volumes, but is in great want of foreign geographical publications, and makes an appeal to the geographical societies throughout the world to send their publications and, if possible, series of former publications, which ought to be addressed to the Secretary of the East Siberian branch at Irkutsk. The chief occupations of the Society were: the geological exploration east of Lake Baikal, by M. Chersky, who has already published a map of the western coast of the lake; archæological researches as to the prehistoric inhabitants of Siberia, by MM. Agapitoff, Khangaloff, Witkovsky, and Bogolubskiy; and the part it took in the organisation of the Arctic Meteorological Station at the mouth of the Lena, and of a series of four intermediate stations between Irkutsk and this station. This last scheme could not be realised in full, but two stations have already been opened at Verkholensk and at Preobrajenskoye. The last number of the *Journal* of the Society contains, besides the annual report and the proceedings, a list of new determinations of latitudes and longitudes in Transbaikalia; a notice on Shamanisur with Yakuts; a paper on the populations of the basin of the Amur, according to Prof. Schrenck; a paper on the inscriptions on stones and rocks in the district of Minusinsk; and several notes, on the Lena Meteorological Station, on the Usuri region, &c.

Petermann's Mittheilungen for May contains a paper by Mr. Carl Bock describing a journey recently made by him from Bankok to the frontiers of the independent Shan States. He travelled along the Menam River in a boat given him by the Siamese Government, as far as Raheng, where he diverged into the Me Ping. He then proceeded partly by the river, partly by land through Lakon and Lampun, to a town which he calls Tschengmai, but which is more generally known as Kiangmai, or Zimmé. This place, which is the capital of the Shan States tributary to Siam, is an important point in Mr. Colquhoun's proposed railway from Rangoon and Moulmein, into south-western China. It formed the proposed terminus, too, of that gentleman's recent journey through Yunnan and the Shan States. Mr. Bock described it as a fortified town of about 700,000 people, lying in a fertile plain of uninterrupted rice fields, about 500 yards from the Me Ping, which is here 400 feet wide. Even now it is of great political and commercial importance, as it controls the trade of these regions both with Siam and with British Burmah. The teak forests of the States he describes as almost inexhaustible, especially higher up near the Meikong, where, however, it is not yet known whether the lumber can be easily floated down to the sea. For this purpose Mr. Bock recommends a careful survey of the various rivers and their tributaries. From Zimme he continued his way higher up to Kiangtsen, in the valley of the Meikong, and on the borders of the independent Shan States. It was his original intention to travel through these States into Yunnan, as it was Mr. Colquhoun's to travel through them from Yunnan, southwards. Failing this, he returned to the Me Ping, with the object of tracing this river to its source. He was prevented from carrying out either project by the native hostility, which, we regret to say, Mr. Bock himself did much to intensify, if not arouse, by his indiscreet behaviour. It would be inconceivable, if we did not have it on his own testimony, that any traveller among a people who, as he was specially warned, disliked even the Siamese, and absolutely hated any white man, should so far forget all discretion as to enter a populous town and "out of his own hand," as he describes it, take possession of the court of justice, and assault with a stick the official who endeavoured to prevent this unjustifiable trespass. He was punished by several days' imprisonment, but it is unfortunate for the cause of science that the hostility thus carelessly and wilfully aroused should have put a speedy termination to a journey full of promise. Mr. Bock, however, has shown beyond doubt that a railway from Bankok to the Shan frontiers is a possibility. It would pass through populous and rich districts in the valleys of the Menam and Me Ping. He says that no one who has not visited Zimmé can understand how extensive the trade of the place is, and his proposed railway would place the Laos States in direct communication with the sea, and attract the commerce not only of the Shan States, but also of Yunnan. These are exactly the arguments by which Mr. Colquhoun supports his scheme for a railway to Rangoon. Let us hope that in days to come, when this colossal project is an accomplished fact, there may be no dispute as to the originator of the idea of attracting the trade of south-western China to the sea by means of a railway through the Shan States.

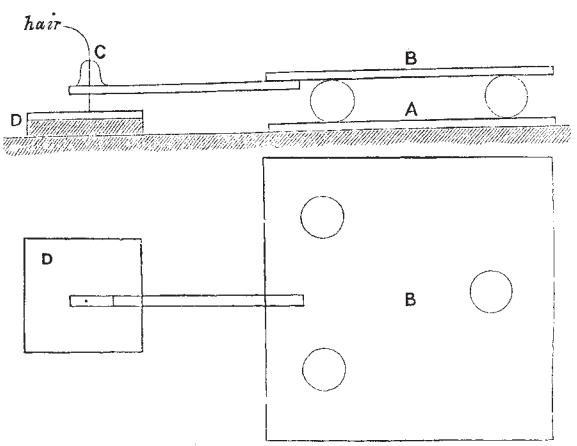
A NEW FORM OF SEISMOGRAPH[1]

NUMEROUS forms of seismometers have from time to time been invented, and having these various instruments, it may be asked why there is any necessity for a new form, and I can best answer this by quoting from a report of a committee of the British Association of 1872, as follows:—"Some simple and cheap method of indicating earthquake movement is thus much to be desired—any apparatus for the purpose should occupy small space, be little liable to derangement, capable of being put up in any apartment not of special construction, and its indications such as any intelligent person could easily interpret and readily note."

Now none of the instruments yet invented fulfil these conditions, and hence I bring before you one which is of the very simplest nature.

The idea of the instrument I propose was suggested to me by the aseismatic arrangement designed by my father, Mr. David Stevenson, for averting damage to buildings and lighthouse apparatus in countries subject to earthquakes (*Trans. Roy. Scot. Soc. Arts.* vol. vii.).

The instrument is shown below, and consists of a ground and polished glass plate (A), about 5 inches square, placed level (once for all), on which rest three accurately turned ivory balls about 1½ inch diameter, and on the top of these



balls is placed a plate (B) similar to the lower, but having attached to it a projecting arm with a long vertical hole pierced through it. Through this hole passes a steel needle (C) with a fine point, which rests by its own weight on a lampblack surface formed on the plate D. A hair about 2 inches long should be fixed to the eye of the needle to assist in adjusting it. The instrument thus becomes a pendulum of infinite length, so that whenever there is any movement of the ground, and therefore of the lower plates, the top plate with its arm and needle attached remain practically steady, and the point of the needle therefore marks on the lampblack surface the amount of motion and the direction in which the lower plate is moved. This instrument, it will be observed, fulfils all the requirements mentioned in the report of the committee of the British Associa-

[1] Abstract of paper read before the Royal Scottish Society of Arts, February 13, 1882, by Charles A. Stevenson, C.E., Edinburgh.